Field Repair Procedure
Sample Line Replacement (SS Injection Needle) and Testing

DT00295

The world leader in serving science

Revisions

Revision	Change Description	Changed By/Date
A	New Release	NML 4/12/2023
B	Changes to reflect new Stainless Steel Injection Needle	CH 6/23/2023

Part/Tool List

Part Number/Name	Description
PS00234	Sample Line and Probe
Included in PS00320	Black Plastic Torque Wrench

Document Number	Description
DT00269	Field Install Instructions for Stainless Steel Injection Needle (Upgrading from Glass to Stainless Steel)

Notice

PPE

Use personal protective equipment (PPE) including but not limited to gloves and Safety Goggles.
Follow all site-specific Safety rules and recommendations.

Why are you doing this operation?

Symptoms

- Low viability
- Inconsistent Droplet Maintenance
- High Carryover
- Inconsistent event rate
- Probe crashes
- Contamination
- False Sample Low warnings
- Bent Probe

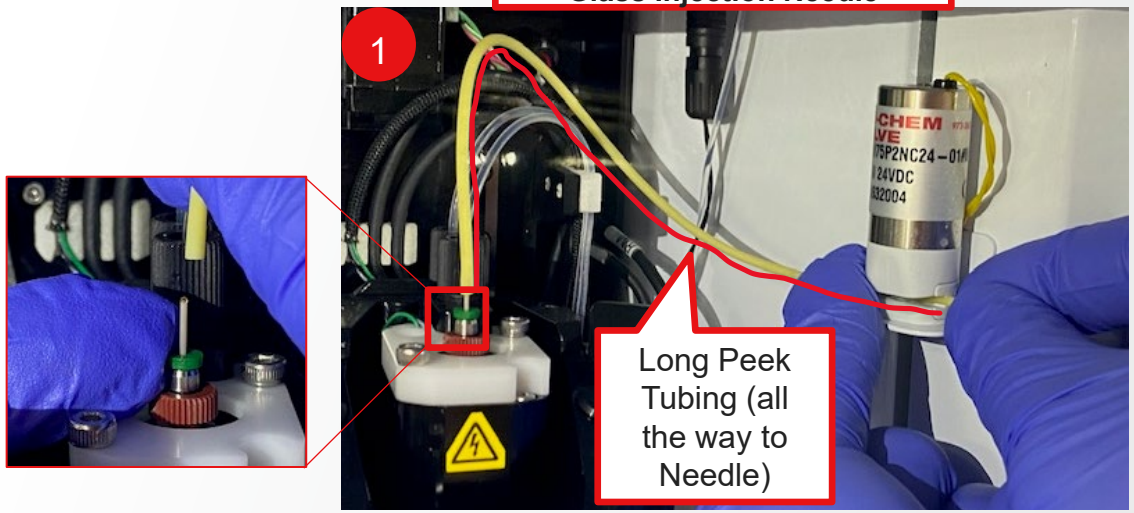
Failed Tests

- Sample Line Backflow Test
- Sample Line Carryover Test

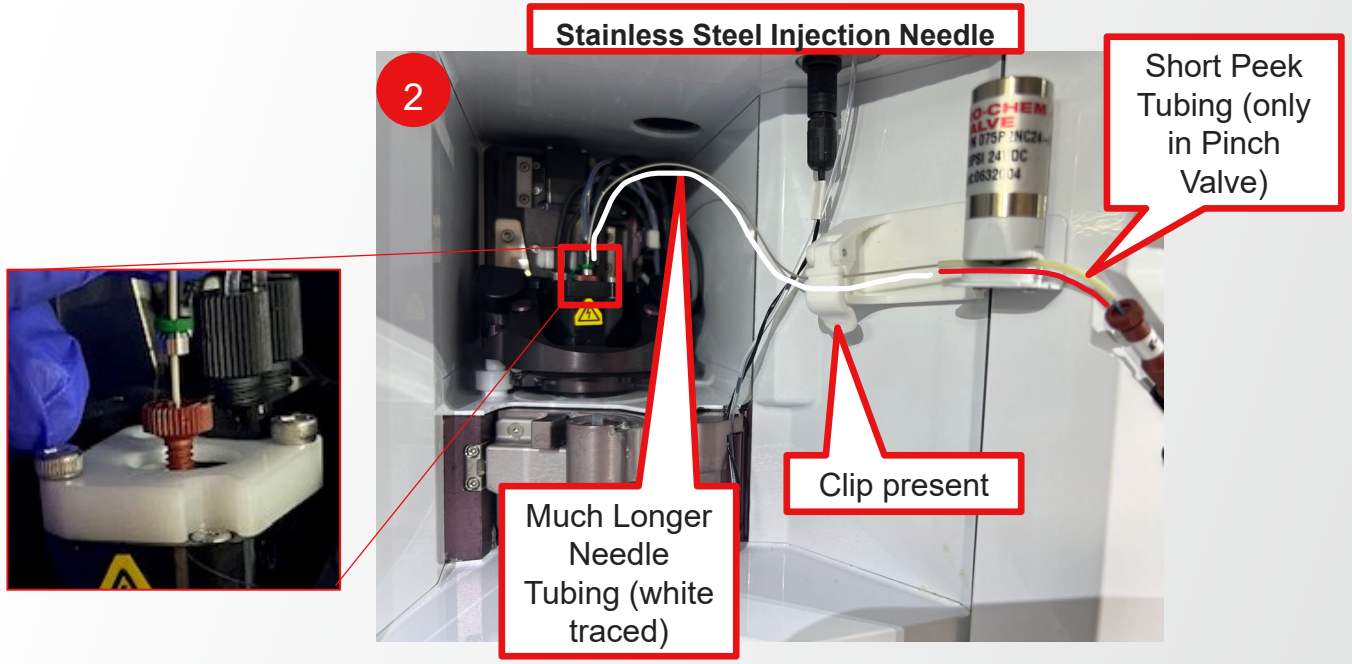
Initial Evaluation

1	Determine whether this instrument has a Glass Injection Needle or a Stainless Steel Injection Needle.
*	More helpful tips for identifying in photos 1 and 2
2	If Glass Injection Needle is present, must execute step within reference document **DT00269** to remove Glass Injection Needle prior to proceeding with remainder of this procedure.

Glass Injection Needle

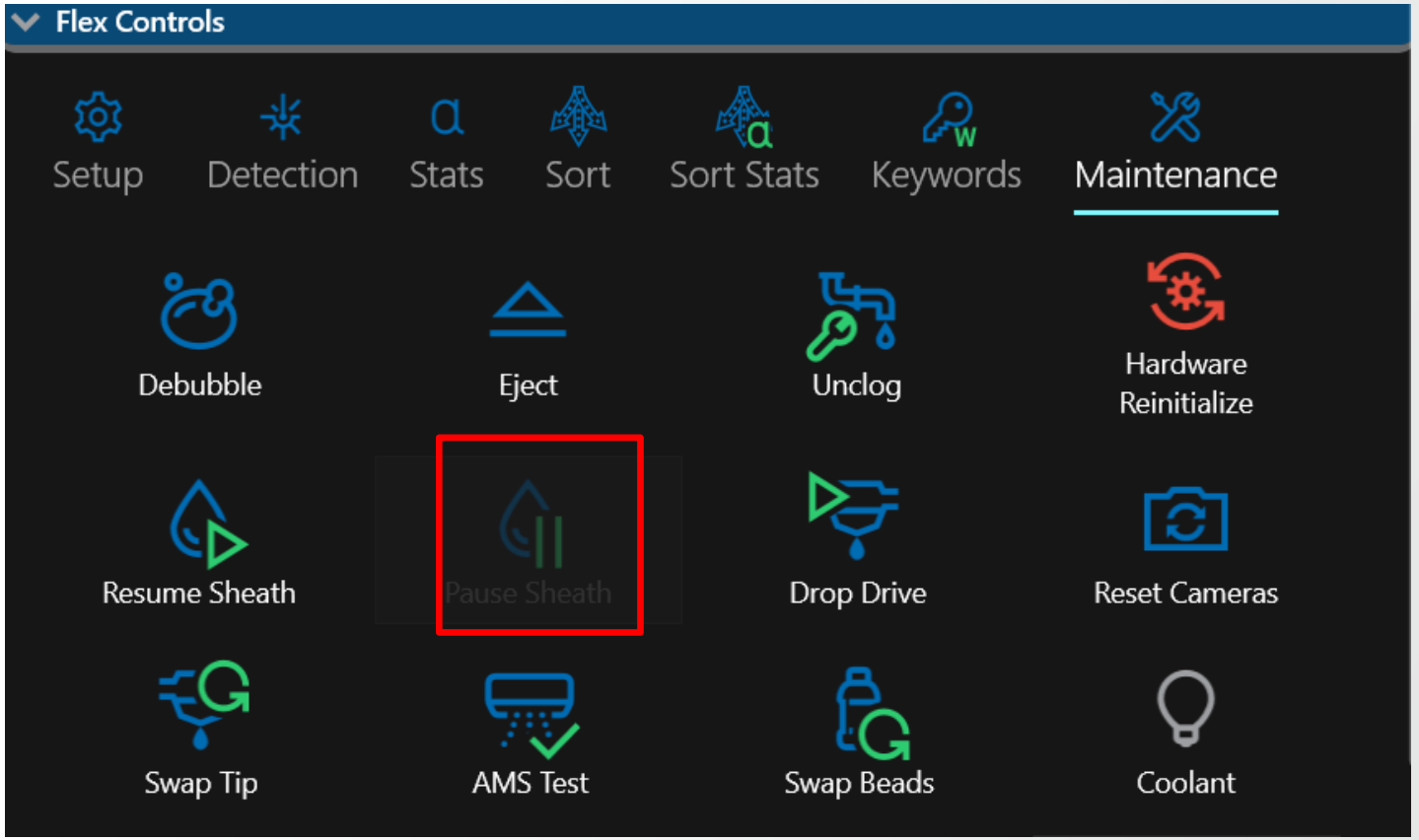


Stainless Steel Injection Needle



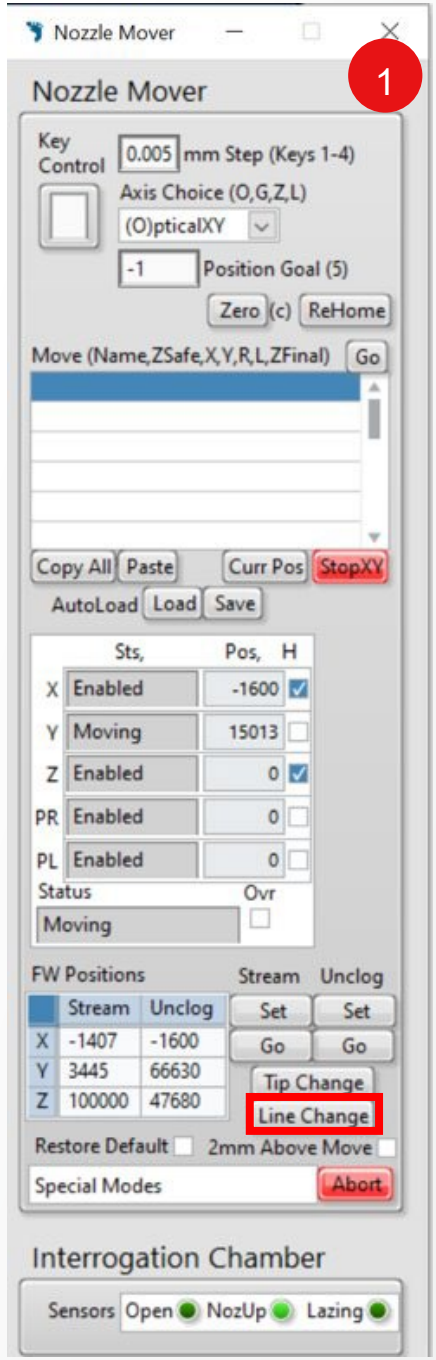
Power on and Start up

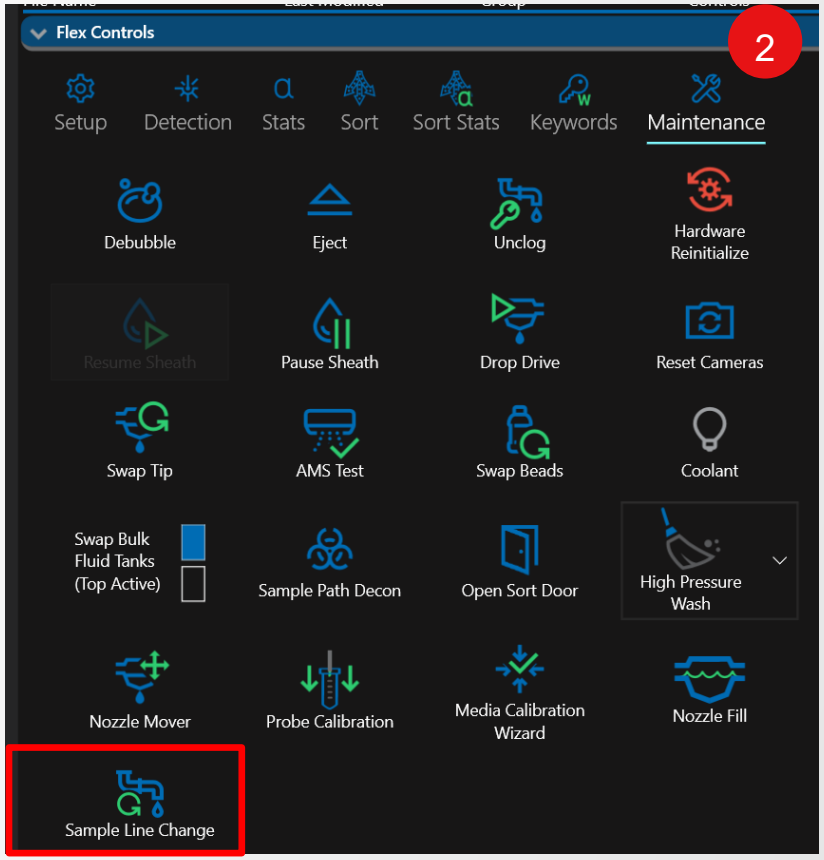
1	Start up instrument.
2	Pause sheath.



Move Components

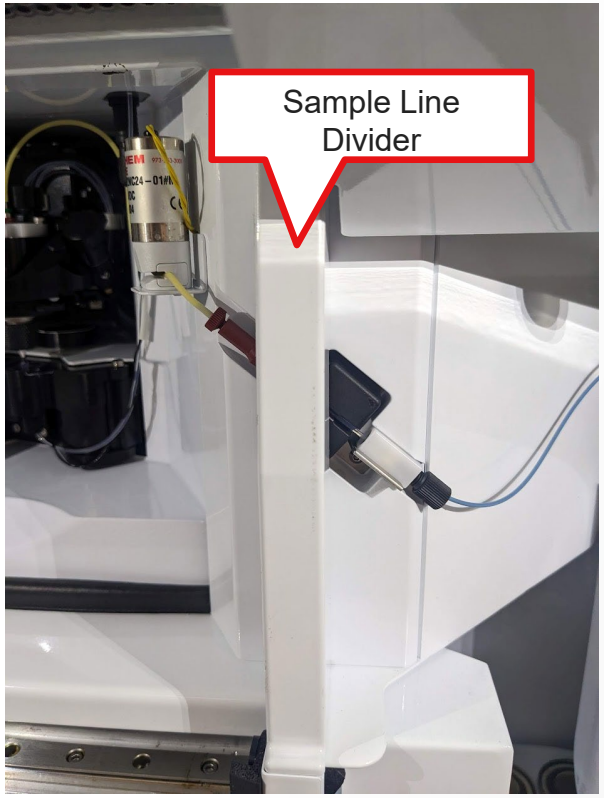
1	Open the “Nozzle Mover” panel in the Service Tool. (Photo 1)
2	Click and select Line Change.
*	Note: In the software version v1.19.2 and later, you can enter the Sample Line Change state via SQS. (Photo 2)
3	Once Nozzle Mover and Loader are done moving, click open the Nozzle Door.

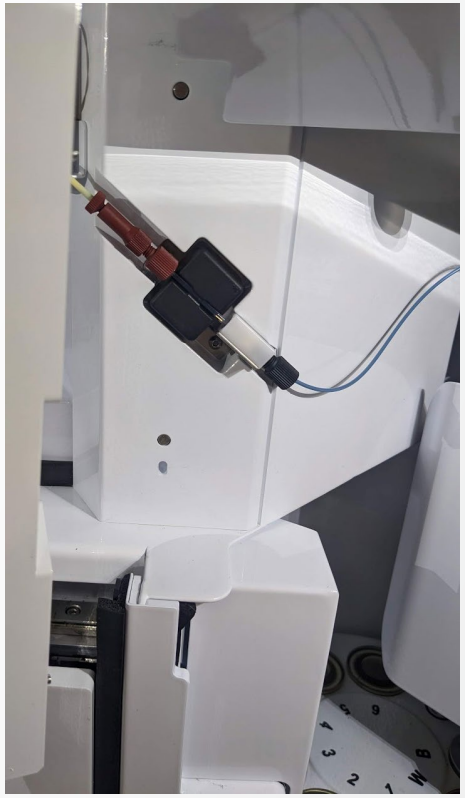




Move Components

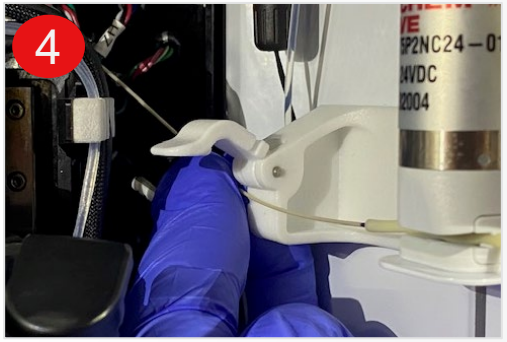
1	Lift up Sample Line cover on the Loader side.
2	Remove Sample Line divider. It is retained by magnets and pins, so a bit of wiggling may be necessary.
3	Remove Loader shield.

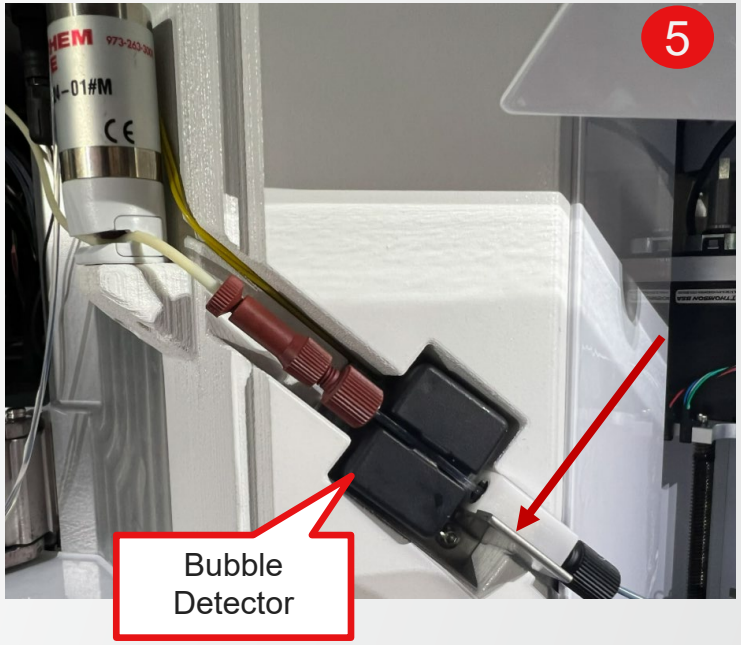


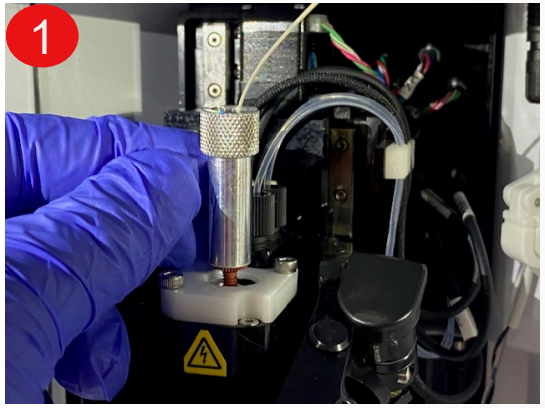


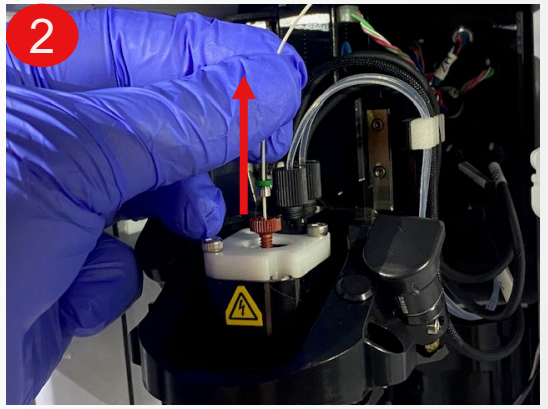
Remove Sample line from the system

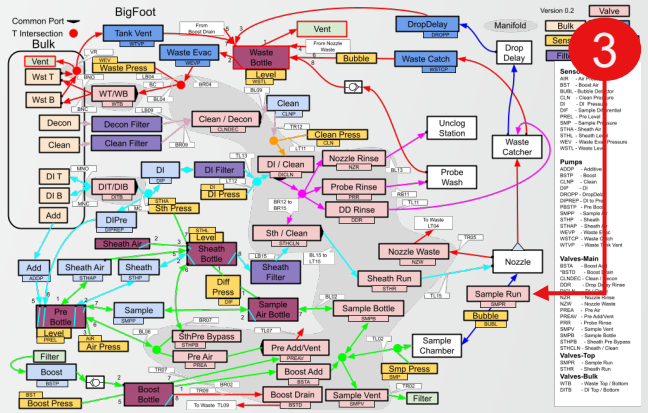
New	
1	Loosing the red cone-shaped piece of sample line that is inserted into the nozzle body.
2	Gently pull both the sample line and the red cone-shaped piece out of the nozzle body.
3	Release the Pinch Valve by opening the **Fluidic Schematic panel,** clicking master override and then clicking on the “Sample” button.
4	Open the clip, releasing the sample line pharmed tubing.
5	Remove Sample Line from Bubble Detector, achieved by gently depressing metal clip to release white IDEX connector.





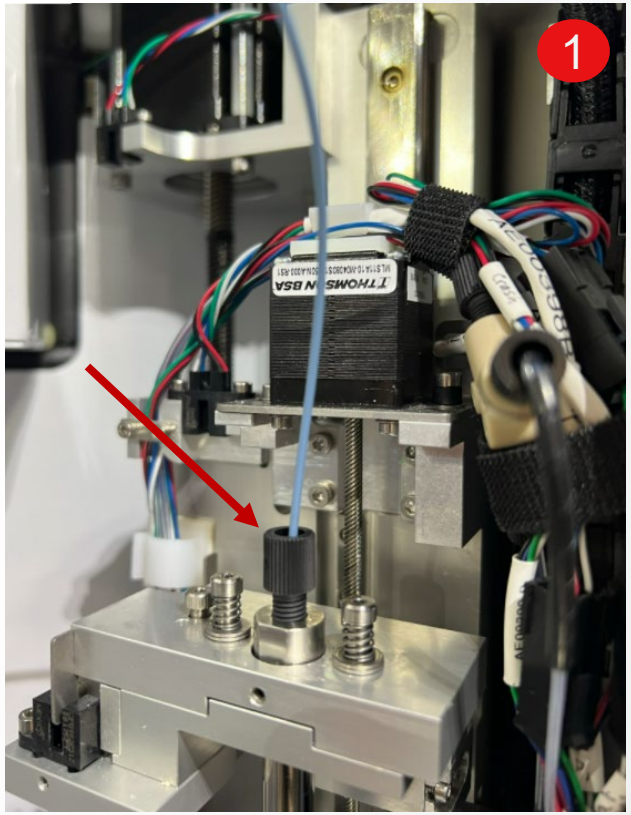






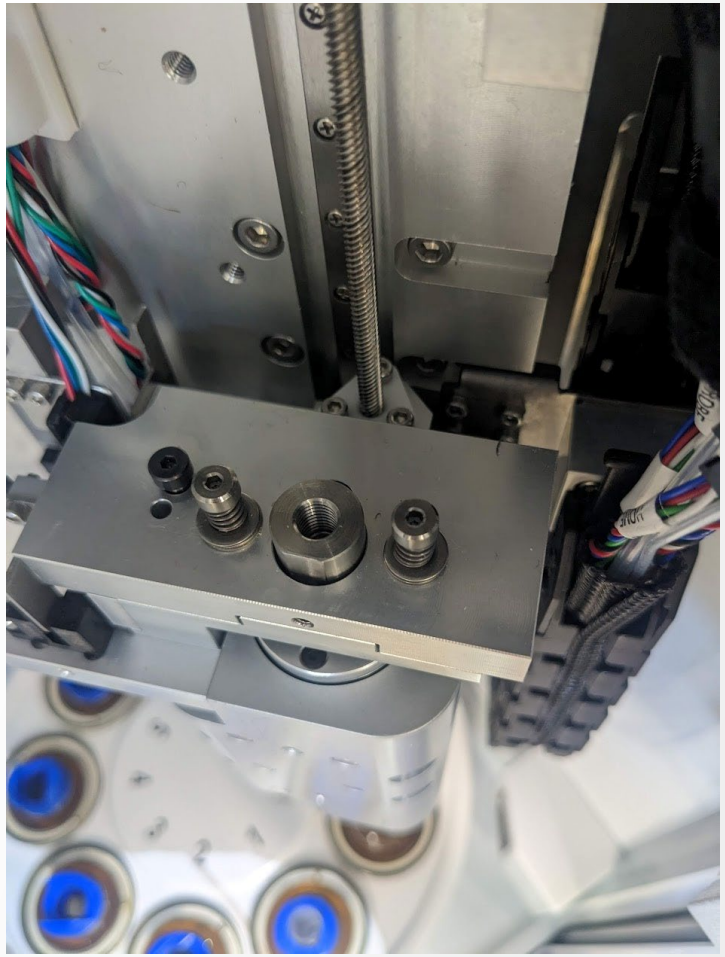
Remove Sample line from the system

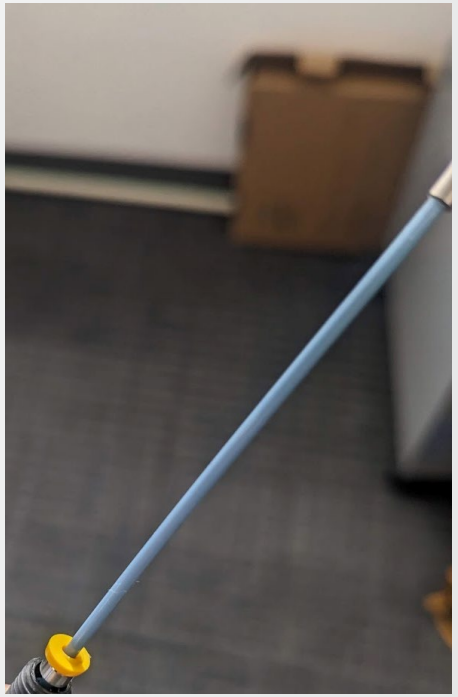
1	Unscrew the black fitting from the loader and slide the probe through up and out of the loader.
2	The sample line should now be free to remove from the system.



Clean Out Probe Hole

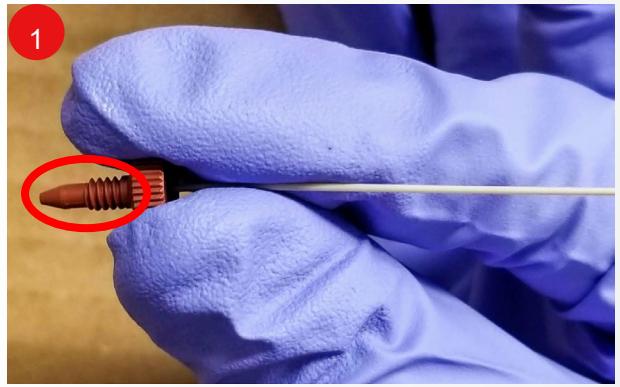
1	Using a cotton tipped applicator soaked in ethanol wipe out the probe mount so that the inside is free of debris that could compromise sealing.
2	Inspect the ferrule sealing surface for any debris or defects that could compromise sealing

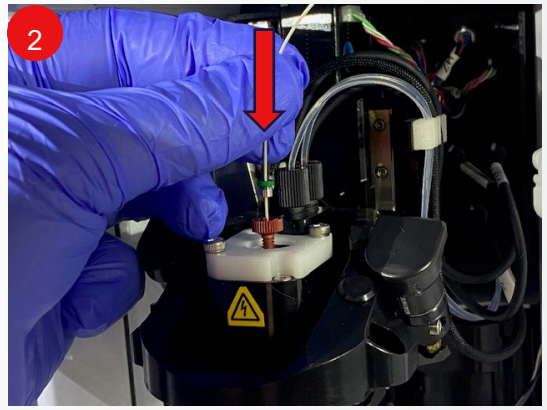


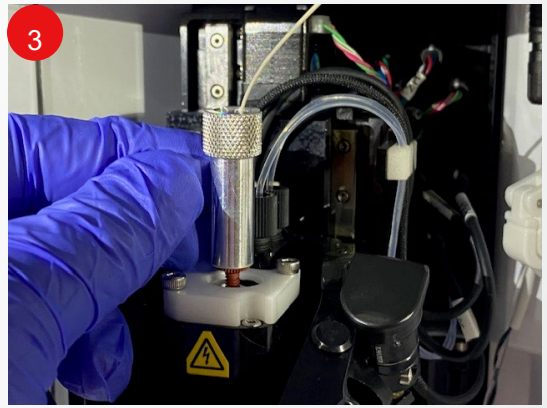


DT00295

Install Stainless Steel Injection Needle	
1	Grab **Stainless Steel Injection Needle,** grip red fitting at the top so the fitting and injection needle can be held at the same time. Slide injection needle back until needle is no longer visibly protruding from tip of red cone fitting. (Picture 1)
2	With the end fully protected by the fitting, insert into the top of the nozzle body. Bending the needle in a gentle curve will make installation easier, do not kink needle in sharp bend. (Picture 2)
3	Push the needle through until the green and steel stop (ferrule) on the tubing hits the top of the red fitting. (Picture 2)
4	Tighten partially by hand **(Peek, 0.032 in OD, 80 mm Long)** then push the stop down again to make sure it is seated. (Picture 3)
5	Final tighten until the needle cannot be shifted by hand when pulling upward with light force. (Picture 3)

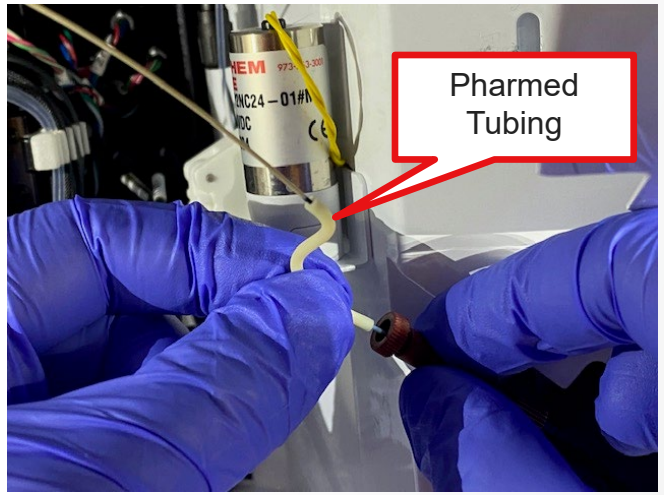


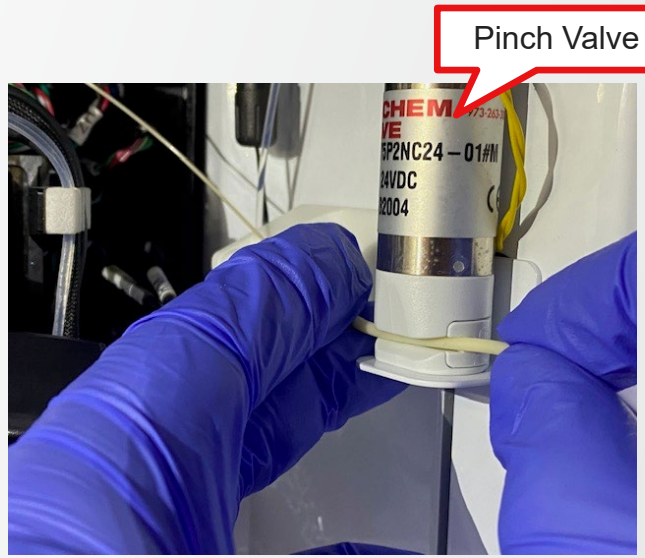


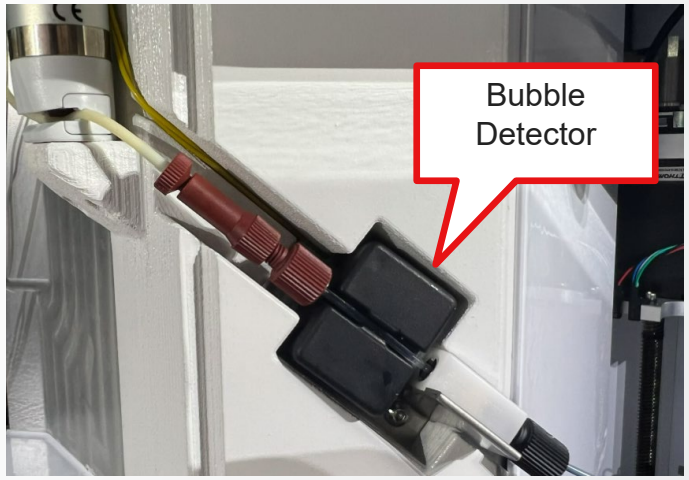


DT00295

Stainless Steel Injection Needle Tan Pharmed connection	
1	The needle will include the correct length of 45 mm Tan Pharmed Tubing.
2	Insert this blue peek part of the red union, 3 to 5 mm deep, into the new tan pharmed tubing, and then pull back 1 mm to prevent any bunching of inside of the tube.
3	Push tan pharmed tubing back into pinch valve, making sure it is fully seated
4	If sample line was removed from bubble detector, re-install. Clip in the white IDEX connector into place.
*	**Note:** If the bubble detector is not inserted properly, SQS will produce an error stating the sample is low or empty.

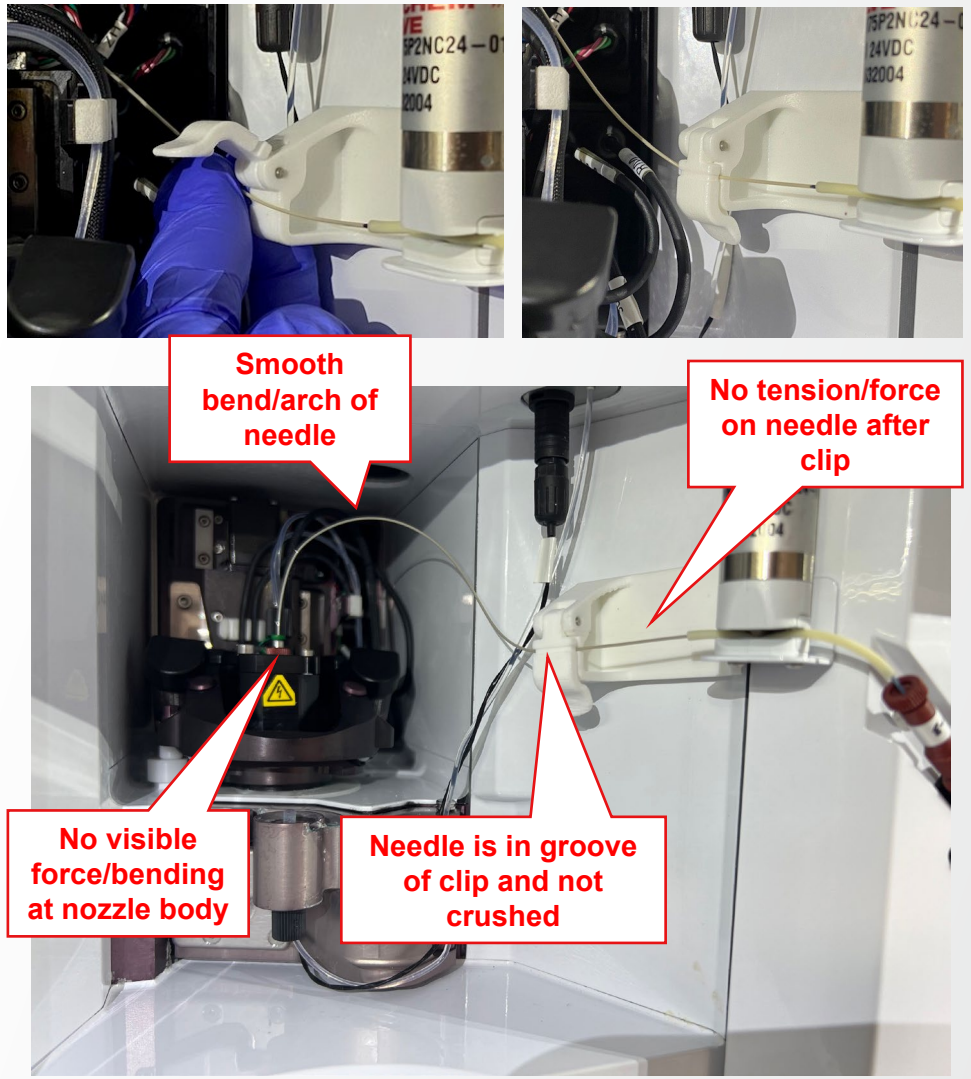




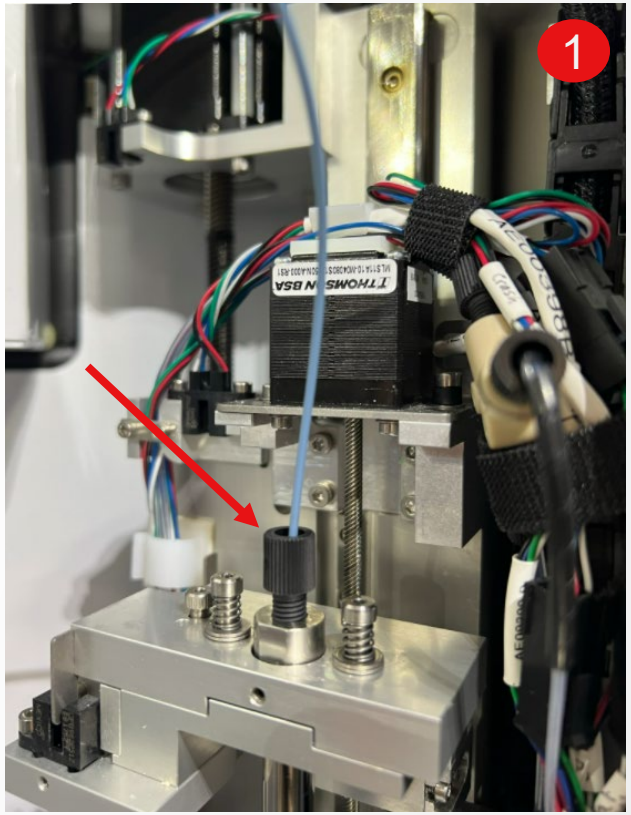


DT00295

Stainless Steel Injection Needle Install into Clip	
1	Open the clip, and place needle into clip, make sure that the needle is seated in the groove in the clip to prevent from crushing it.
2	Close the clip, making sure that the needle and tan pharmed tubing are not under tension, and are not bent.
3	The Needle should have a gentle curve coming out of the nozzle body assembly. It should be kink free, and not causing unnecessary bending at the connection to the nozzle body.
4	Close the pinch valve by opening the **Fluidic Schematic panel** and clicking master override and then on the sample button
5	Close the nozzle door

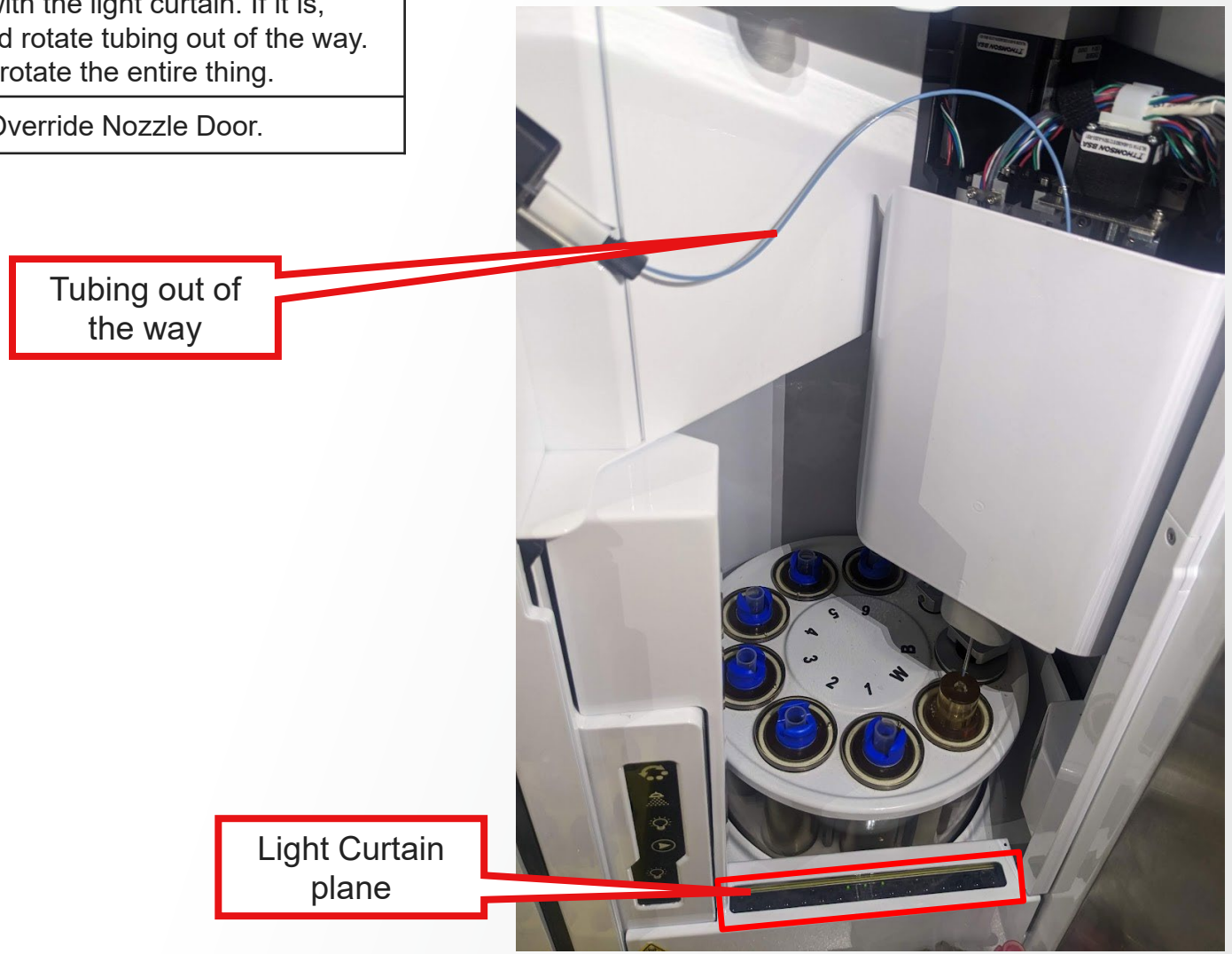


Connect Sample Line to Loader	
1	Feed the probe back through the loader and tighten the black fitting.



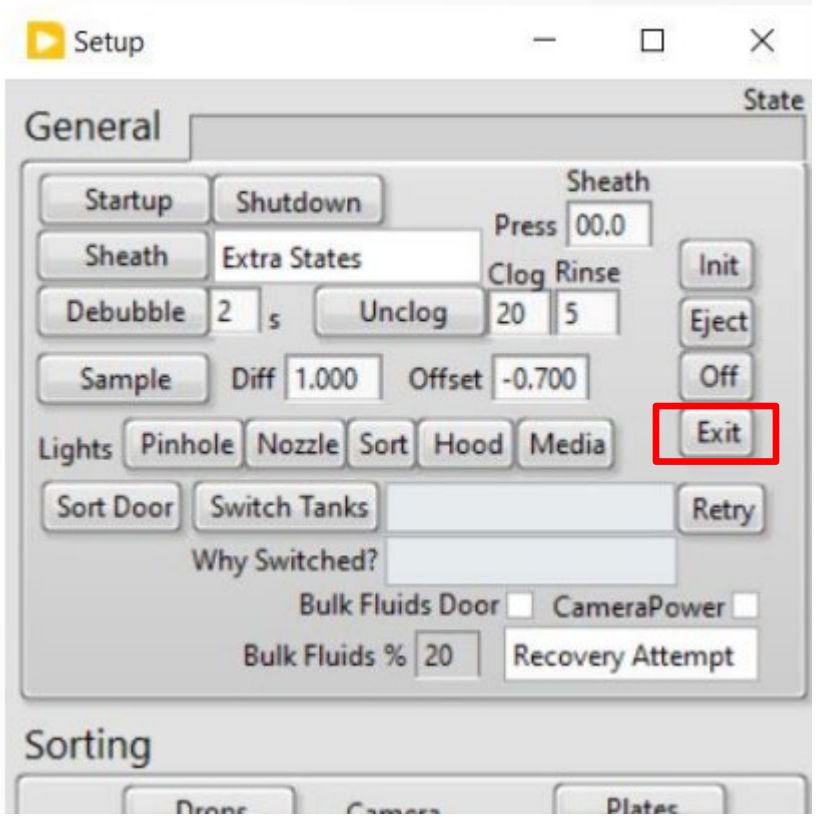
Tubing Routing

1	Verify the blue tubing is not interfering with the light curtain. If it is, remove the white union from the clip and rotate tubing out of the way. Do not unscrew fittings from union, just rotate the entire thing.
2	Open Service Tool > Overrides Panel. Override Nozzle Door.



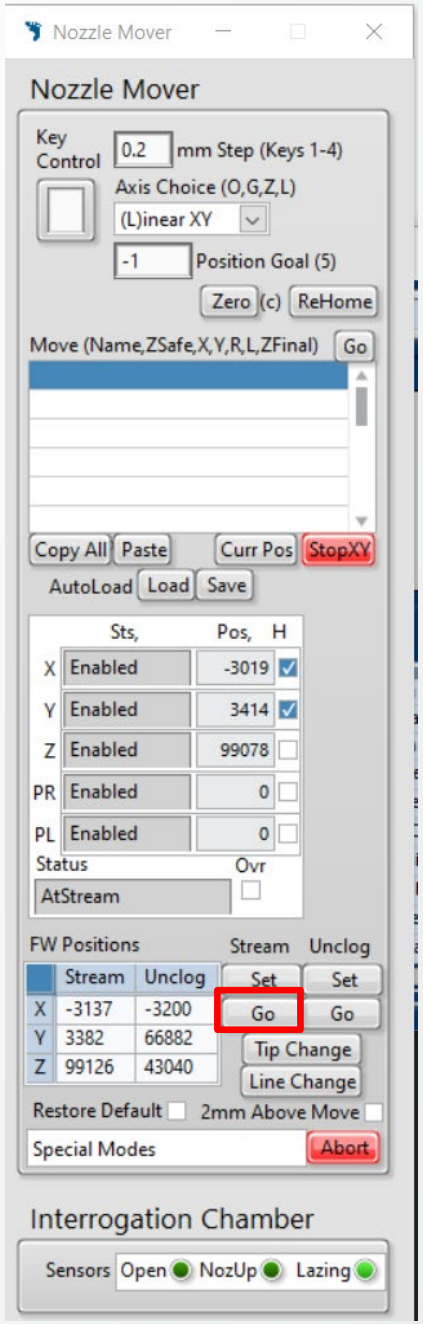
Exit Extra State

*	Note: If Sample Line was swapped from the SQS button, the following 2 steps are not necessary. Click on the “Okay” button to move to the next step in this case. Be sure to have cleaner loaded in position 1.
1	Open Service Tool > Overrides Panel. Override Nozzle Door.
2	In Service Tool > Set Up Panel, Click Exit.



Watch Nozzle Motion

*	**Note:** If Sample Line was swapped from the SQS button, the next step is not necessary.
1	Open Service Tool > Nozzle Mover. Click Stream Go
2	Watch the Nozzle retract into the instrument and make sure the sample line does not catch on anything.
3	In SQS, click Resume Sheath. Observe the Sample Line/Injection Needle junction for leaks or movement. We want to make sure the line is secure.



Sample Line Backflow Test

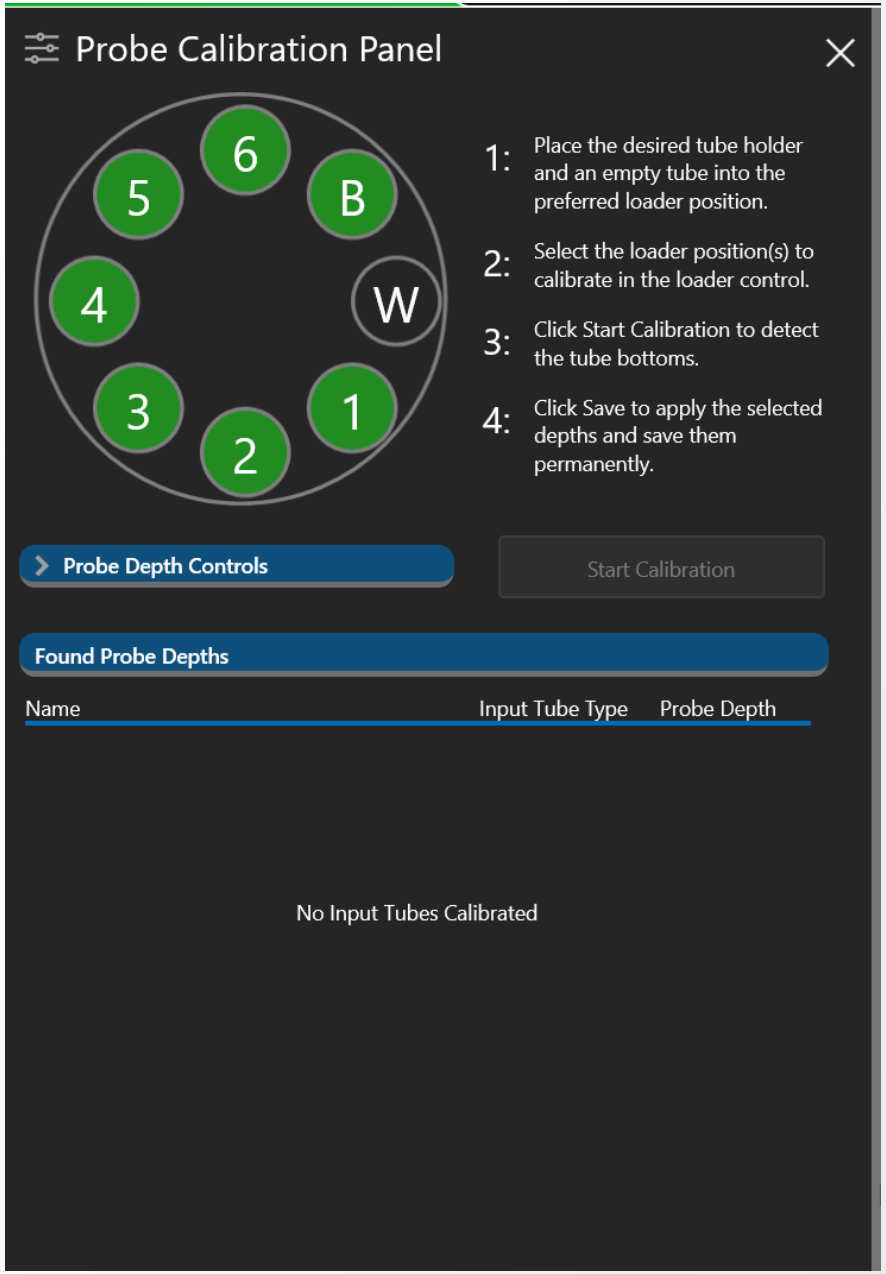
1	To confirm new sample line is not clogged, perform ***Sample Line Backflow Test**
2	If test does not pass, replace sample line again, do not disassemble sample line to clear clog. Report clogged line to bigfootquality@thermofisher.com

Turret Calibration

1	Probes can point slightly different directions from each other and can possibly catch on the wash station. In order to confirm the probe can successfully clear the wash station, perform ***Turret Calibration Procedure.**
2	If calibration fails, rotate and retighten the probe and recalibrate.

Probe Depth Calibration

1	In SQS, open the Maintenance Tab and select Probe Calibration
2	Select positions in the panel and click Start Calibration
3	Install at least one tube of each type in the loader (1.5ml, 5ml, 15ml)
4	After the process is complete, select the depths and hit Save

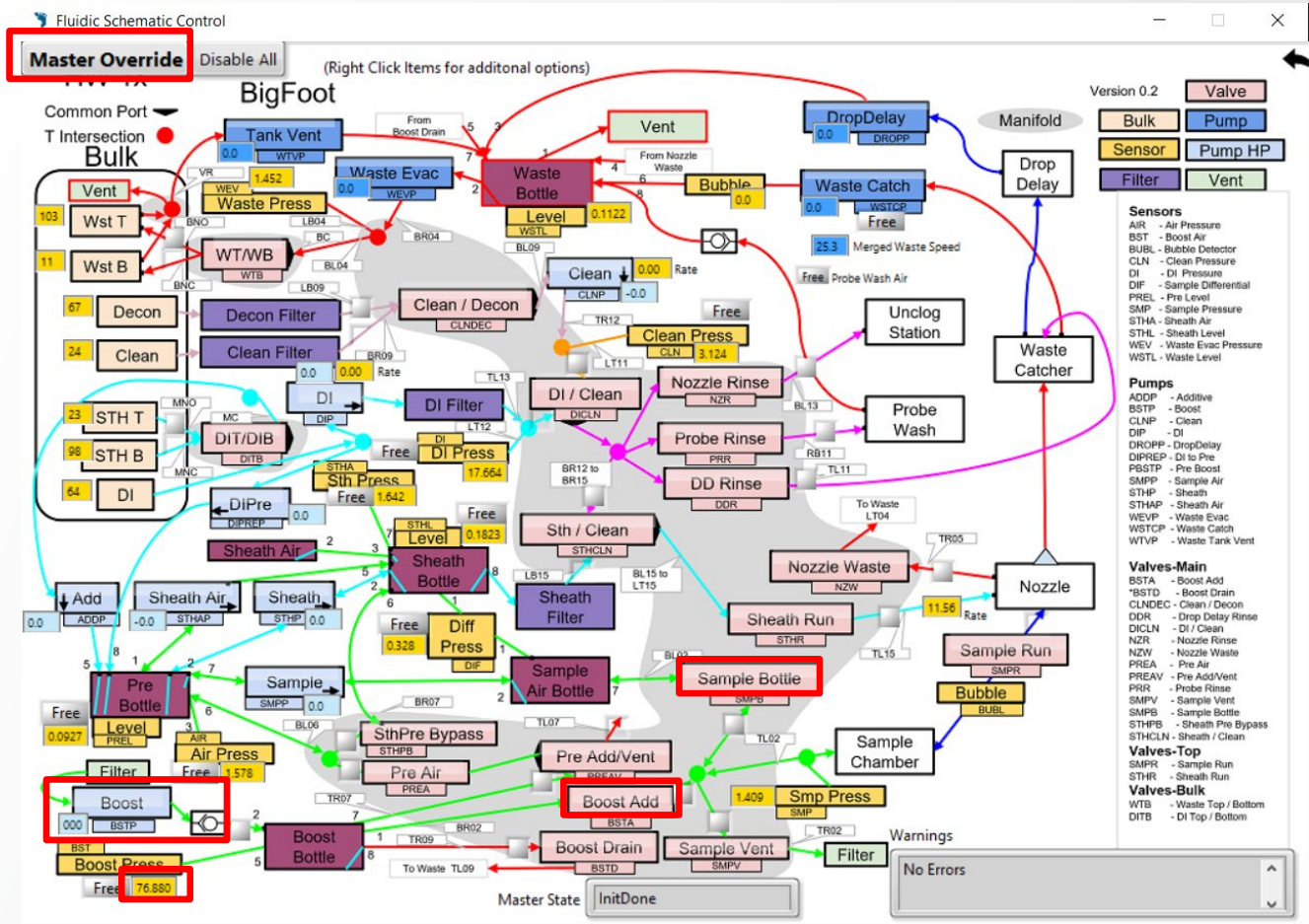


Loader Position Pressure Test

1	Perform ***DT00230 - Loader Position Pressure Test**

Test Sample Line/Injection Needle Junction

1	Load a tube of filtered DI into position 1. Begin acquiring from position 1.
2	Open Service Tool > Fluidics Schematic. Click Master Override.
3	Open the Boost Add Valve.
4	Close the Sample Bottle Valve.
5	Turn Boost Pump on to raise Boost Pressure to 65psi.
6	Observe the Sample Line/Injection Needle junction for leaks or movement. We are looking for any indication that this line is not secure

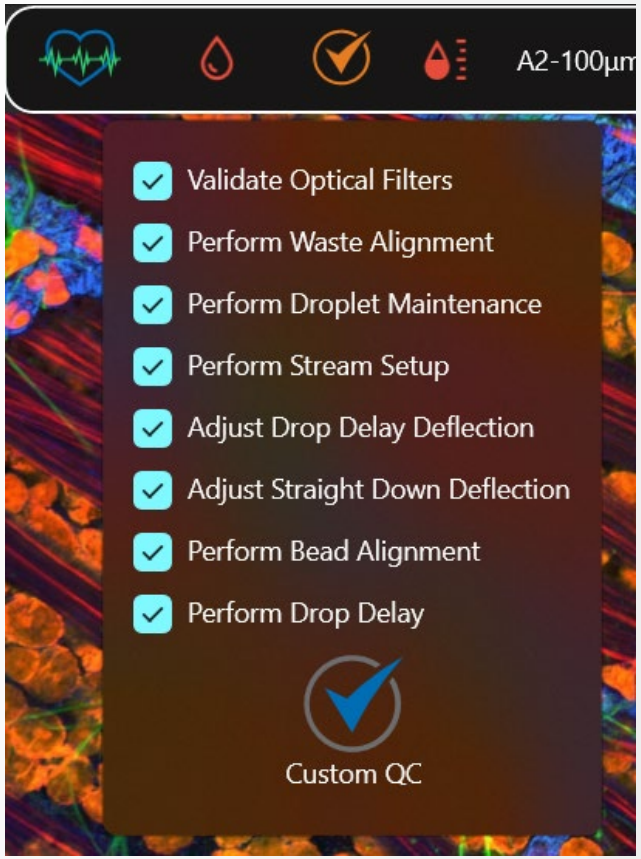


Test Sample Line/Injection Needle Junction

1	Unselect Master Override in Fluidics Schematic
2	Stop Acquiring
3	Close Nozzle Door
4	Open Service Tool > Override. Uncheck Nozzle Door
5	Click Resume Sheath

Run Full QC

1	Run a Full QC
2	If it fails during either Bead Alignment or Drop Delay, you may need to alter: • ***DT00228 - Sample Pressure Offset** • ***DT00229 - Boots Pressure and Time**



Wash Calibration

1	Perform ***DT00272 – Wash Calibration**